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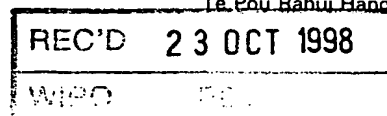
CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that the annexed is a true copy of the Provisional Specification as filed on 16 July 1997 with an application for Letters Patent number 328355 made by O'CONNOR, PAUL MICHAEL.

Dated 05 October 1998.

**PRIORITY
DOCUMENT**
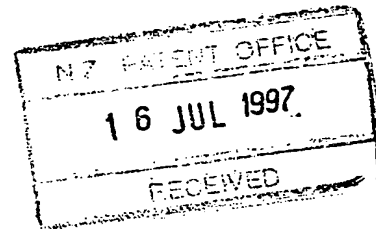SUBMITTED OR TRANSMITTED IN
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Neville Harris
Commissioner of Patents

328355

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Patents Form No. 4

15   PATENTS ACT 1953

PROVISIONAL SPECIFICATION

METHOD AND SYSTEM FOR COMPILING DEMOGRAPHIC DATA

20   ABOUT CUSTOMERS BASED UPON RETAIL TRANSACTIONS

I, PAUL MICHAEL O'CONNOR, a New Zealand citizen, of 250 Wakefield Street, Wellington, New Zealand

do hereby declare this invention to be described in the following statement:

BACKGROUND TO THE INVENTION

This invention relates to a method and system for compiling demographic data about customers based upon retail transactions.

Merchants are currently left in the difficult situation of having little or no idea of customers' characteristics. Their advertising and promotions are at best aimed at a hunch of what will attract their customers to purchase from them. The merchants do not know the demographics or location of their customers, they do not know what other merchants their customers also purchase products from, and the merchants do not know what value to place on individual customers.

Typically this information is only collected by large merchants either through their own customer database or through market research.

PRIOR ART

Methods and systems for building databases for marketing purposes are known in the art.

One form of system is described in US Patent No. 5,636,346. A method is described of creating a database or a modelled profile of information for customers of an advertiser. This database consists of subscriber names and address information and is compiled from actual cable system and telephone company billing records. The database is then licensed to data processing companies or their clients to be matched with their own customer databases. A target subscriber list is produced from subscribers in the modelled profile which are not already in the customer database, and these subscribers are targeted directly.

Another system is described in US Patent No. 5,305,196. A method is described for building a database for use in a retail store marketing program in which a customer's cheque is scanned to detect an account identification number. This unique identification number is then compared against a stored database of customer

identification numbers. The database is then updated if necessary with additional identification criteria. A list of prospective customers of the retail store in a predetermined geographical area is obtained through conventional sources. The list of prospective customers is then compared with the list of regular customers and

5   customers which appear in both lists are removed from the list of prospective customers. Advertising material may then be mailed directly to the remaining customers in the prospective customers list.

In the abovementioned prior art, the merchant is provided with little more than a list

10   of customers toward which direct marketing may be focused. It would be particularly advantageous to provide the merchant with characteristics and other information about actual and prospective customers.

OBJECT OF THE INVENTION

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An object of the present invention is to provide an improved method and system for compiling demographic data about customers based upon retail transactions.

DISCLOSURE OF THE INVENTION

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Accordingly in one aspect the invention may broadly be said to consist in a method for compiling demographic data about customers based upon retail transactions comprising the steps of:

25   providing transaction details, the transaction details comprising a customer identification code, a merchant identification code, a transaction amount and a transaction date and time;
transmitting the transaction details to a data processor which includes a stored database of unique customer identification codes and merchant identification codes;

30   entering the transaction details into the database for storage in conjunction with the customer identification code and merchant code;
providing data including at least demographic data about customers based on the customer identification codes and merchant identification codes from the database.

Preferably the data processor includes a stored database of customer locations and the method comprises the step of providing data about customers based on the customer locations.

5   Preferably the data processor includes a stored database of transaction amounts and the method comprises the step of providing data about customers based on the transaction amounts.

Preferably the transaction details comprise a product identification code, the data
10   processor includes a stored database of product identification codes and the method comprises the step of providing data about customers based on the product identification codes.

Preferably the data processor includes a stored database of census data and the
15   method comprises the step of providing data about customers based on the census data.

Preferably the method comprises the step of providing temporal data to identify changes in the demographic data.
20
In a further aspect the invention may broadly be said to consist in a system for compiling data about customers based upon retail transactions comprising:

a memory for storing transaction details, the transaction details comprising a customer identification code, a merchant identification code, a transaction amount and a
25   transaction date and time;

a data processor, the data processor including a stored database of unique customer identification codes and merchant identification codes;

means for transmitting the transaction details from the memory to the data processor;

means for entering the transaction details into the database for storage in conjunction
30   with the customer identification code and merchant code;

means for providing data including at least demographic data about customers based on the customer identification codes and merchant identification codes from the database.

Preferably the data processor includes a stored database of customer locations and the system comprises means for providing data about customers based on the customer locations.

5   Preferably the data processor includes a stored database of transaction amounts and the system comprises means for providing data about customers based on the transaction amounts.

Preferably the transaction details comprise a product identification code, the data

10   processor includes a stored database of product identification codes and the system comprises means for providing data about customers based on the product identification codes.

Preferably the data processor includes a stored database of census data and the system

15   comprises means for providing data about customers based on the census data.

Preferably the system comprises means for providing temporal data to identify changes in the demographic data.

20   **BRIEF DESCRIPTION OF THE DRAWINGS**

A preferred embodiment of the method and system for compiling demographic data about customers based upon retail transactions will now be described with reference to the accompanying drawings in which:-

25

Figure 1 shows the system of the invention;

Figure 2 shows the database schema of the invention;

Figure 3 illustrates a typical database entry;

Figure 4 shows the typical characteristics of a group of customers;

30   Figure 5 illustrates a typical analysis of customers by country;

Figure 6 shows further characteristics of a typical group of customers;

Figure 7 illustrates a geographical density map;

Figure 8 shows a typical customer value graph;

Figure 9 shows the merchants with which a typical merchant shares its customers; and

Figure 10 illustrates a table of repeat purchasers.

DISCLOSURE OF THE PREFERRED EMBODIMENTS

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In the preferred form of the invention, as shown in Figure 1, a system 2 comprises a data processor 3 which includes a merchant database 4, a customer database 6, a transaction database 8 and a demographics database 10. For simplicity the invention will be described using data from a single financial institution or bank 24, however the

10 data processor 3 may comprise data obtained from more than one financial institution. The data processor 3 may be maintained by the financial institution 24, a third party or agency (not shown), or even by merchant 16.

A customer 12 purchases goods or services 14 from a merchant 16 with a payment 18.

15 Typically merchant 16 operates in a commercial premises or store from which customer 12 purchases goods or services 14. Alternatively merchant 16 may operate from strategically placed machines, for example vending machines, parking meters, laundry machines and transportation ticketing machines. Merchant 16 may also operate a mail order catalogue service, direct market goods or services, or network

20 market through a hierarchy of distributors and resellers. As is becoming increasingly common, merchant 16 may alternatively operate from a website or other electronic medium.

For security and convenience it is becoming increasingly common for customer 12 to

25 use a payment 18 other than cash. One example is a credit card, in which a sales person either magnetically reads or makes an imprint of the card, calls a processing centre via a dial-up modem to obtain authorisation and verifies the cardholder's signature to prevent fraud. Alternatively the customer 12 may provide the account number and expiry date of the credit card to a merchant 16 who is geographically

30 separated from customer 12. Other alternatives to cash include cheques, electronic funds transfer (EFT-POS) cards, pre-paid money cards, credit, debit or charge cards, and integrated circuit or smart cards.

If a payment method other than cash is used then certain customer information 20 is transferred from the customer 12 to the merchant 16. For example the customer information 20 would include details of the customer's financial account to be debited. The merchant 16 transfers payment 22 to the merchant's own financial institution 24

5   or other financial institution. Also sent to the financial institution 24 is transaction information 26 which includes at least a merchant identifier, a customer identifier, a transaction amount and the date and time of the transaction.

The merchant 16 may operate a loyalty programme, whereby a selected customer 12

10   is distinguished from other customers. Those customers who are members of the loyalty programme are often issued with identification cards. Customer information 20 would include the fact the customer 12 is a member of the loyalty programme.

The merchant's financial institution 24 then transfers payment 28 from the customer's

15   financial account to the merchant's financial account, after which merchant 16 provides customer 12 with goods or services 14.

The data processor 3 has in its merchant database 4 information about all merchants who hold an account at the financial institution. This information includes the name

20   and address of the merchant 16 and the nature of the merchant's business. The information held by the data processor 3 about a merchant 16 is shown in Figure 2 as merchant table 4A having as a primary key a unique merchant identifier 30.

The data processor 3 also has information about other individuals who hold accounts

25   at the financial institution. For example the data processor may have a record of the income, age, gender, marital status, ethnicity, education, telephone numbers, residential address and vocation of individual account holders. The residential address may be specifically defined, or may be an arbitrarily defined geographical area or mesh block. An account holder may be a customer 12 of merchant 16, and if so,

30   information about customer 12 is held in customer database 6. This information is shown in Figure 2 as customer table 6A having as primary key a unique customer identifier 32.

As a customer 12 contracts with merchant 16, details of the transaction information 26 are stored in transaction database 8. An example is shown in Figure 2 in which transaction information is stored in transaction table 8A having as keys merchant identifier 30 and customer identifier 32. The transaction table 8A may also have as

5 key a transaction date/time 34.

Each transaction can only have one merchant, while individual merchants can have more than one transaction. The relationship of the transaction table 8A to merchant table 4A is therefore many-to-one. Similarly, each transaction can have only one

10 customer, while individual customers can have more than one transaction. The relationship of the transaction table 8A to customer table 6A is therefore also many-to-one.

The data processor 3 has access to all information contained in merchant table 4A.

15 customer table 6A and transaction table 8A. From the data in these tables it is possible to produce reports for a merchant 16 giving the merchant 16 detailed information about its customers 12. For example, it is possible to estimate the average annual salary of the national population based on the average income of its own account holders. It is also possible to identify the customers 12 of merchant 16 based

20 on the accumulated transaction data and therefore estimate the average income of customers 12 of a particular merchant 16. Information such as this is very valuable to merchant 16 as it then knows where to focus marketing efforts. It is also possible to provide merchant 16 with other demographic characteristics of its customers 12. for example age, gender, marital status, ethnicity, education and vocation.

25

In some circumstances a number of financial institutions may each transmit certain data to data processor 3, so that merchant 16 can obtain information about its customers 12 holding accounts at different financial institutions.

30 Based on characteristics of customers 12. it is possible to provide merchant 16 with customer segmentation data. For example the merchant 16 may be provided with the proportion of its customers who are in a particular income range to assist in developing marketing strategies.

It is also possible to provide details of the customers 12 a particular merchant 16 shares with other merchants who hold an account at the same financial institution 24. The transaction information 26 includes a merchant identifier and a customer identifier. Based on this information the proportion and characteristics of customers

5   12 a merchant 16 shares with competing merchants can be determined. A merchant 16 may then have an idea of its market share and know the types of customers 12 on which to focus marketing initiatives. It is also possible to provide the merchant 16 information about the customers 12 the merchant 16 shares with merchants in other markets. This would allow, for example, a fast food retailer to assess the merits of

10 joint advertising with a petrol station if the merchants share a large proportion of customers.

The transaction information 26 also includes temporal data, for example the date and time of transactions. It is therefore possible to identify the date and time different

15 customer types are likely to purchase goods or services from merchant 16.

In a preferred form of the invention the data processor 3 includes a stored database of customer locations, including residential addresses, post codes and telephone numbers. From this information it is possible to produce density maps of customer

20 types of merchant 16 based on the geographical locations, post codes and/or telephone numbers of customers 12. The scale of these density maps may be local, regional, national or global.

In a further preferred form of the invention the data processor 3 includes a stored

25 database of transaction amounts of transactions between customers 12 and merchants 16. From this information the characteristics of a merchant's customers from which the merchant derives the most revenue, or most valued customers can be determined.

The transaction details may also include a product identification code. This allows the

30 quantity and characteristics of products purchased by customers 12 to be determined. For example, a merchant 16 who does not sell a particular product may be interested to know that a competitor is selling large quantities of the product. If the merchant 16 offered the same product for sale then customers may purchase products from merchant 16 instead of the competitor.

The product identification code is also useful in evaluating the response to the use of coupons. Generally, coupons are issued to existing customers or are distributed to a particular geographical region. Coupons generally offer a discount on subsequent purchases, or additional complimentary goods or services with subsequent purchases.

5   Using the product identification code it is possible to determine the characteristics of customers who present coupons and the characteristics of customers who do not.

In addition to the above information, it also possible to obtain specific information on companies or industries. From the information in the data processor 3, comparisons

10   may be made of characteristics of the customers 12 of a merchant 16 in one population with those of another population. This information would be valuable to a merchant 16 introducing a product into a new market who needs to know how well the product has been received in other countries.

15   As stated above the transaction information 26 includes temporal data. The reports may be generated periodically and changes in a merchant's customer base over time can be identified and reported. This use of temporal data is particularly useful in evaluating the success or otherwise of general promotional activity, for example the sale of goods or services at reduced prices.

20

The reports may be presented to the merchant 16 by paper, oral/visual presentation or electronically for example email or secured web access. In a preferred embodiment of the invention the merchant 16 may select which information it requires about its customer base.

25

In the preferred form of the invention the demographic table 10 is produced from information held by the data processor 3. However, other data sources may also be used, for example census data, customer databases, demographic information held by the financial institution 24, other customer transactions, product descriptions and

30   merchant databases.

The system 2 may be tailored to satisfy confidentiality or privacy requirements. For example, details of individual customers may be omitted from merchant reports.

Additionally, details of individual merchants may be omitted for reasons of commercial confidentiality.

The invention will now be more fully described with reference to an example. As shown in Figure 3, a customer has purchased goods from the fictitious company Flowers R Us. The appropriate entries have been made in merchant table 4A, customer table 6A and transaction table 8A. A customer having the unique identifier CUST1, residing in Roseneath, Wellington, New Zealand has purchased flowers to the value of NZS35 from Flowers R Us, a merchant having the unique identifier MERC1. Based on a number of these transactions, it is possible to produce detailed and commercially useful reports for the merchant 16.

Figure 4 shows an example of a report which may be produced for the merchant 16 illustrating general characteristics of Flowers R Us customers. For example the customers are likely to have qualifications and not likely to be unemployed. Characteristics such as these are available to the data processor 3 from financial institution 24 from its account holders and so it is possible to determine that Flowers R Us customers have these characteristics.

As shown in Figure 5, Most of Flowers R Us customers, namely 87.2%, live in New Zealand. This gives the merchant 16 ideas about where to focus its advertising. The nature of this business means that smaller proportions of customer are resident in other countries, although this will not necessarily be the case for other types of business, for example in the travel booking and reservations industry.

Figure 6 shows a further example of characteristics of customers. For simplicity, customers are placed in one of 14 customer types, for example "educated money" or "single and separate". It is possible to estimate from the information in the data processor 3 that 8.25% of New Zealanders are of the type "educated money", and that 5.51% are of the type "single and separate". Based on geographical data about its customers, it may be determined that 11.53% of the population living in the same region as merchant 16 are of type "educated money" and 7.91% are of type "single and separate". Based on transaction data it is possible to work out that 14.63% of Flowers R Us customers are of type "educated money". Furthermore, it is also possible to

estimate the proportion of Flowers R Us "educated money" customers to those "educated money" types living in the same region. For example 14.63% of Flowers R Us customers are of type "educated money" and 11.53% "educated money" types live in the same region. The proportion is 126.89%.

5

The invention allows the production of detailed geographical density maps as shown in Figure 7. In the example shown, all the customers of merchant 16 have been identified. The data processor 3 has geographical data about these customers, and this data may be presented as a density map. This map shows the areas of the country in

10 which Flowers R Us customers live, and would provide a focus for regional or localised advertising.

Figure 8 shows a customer value graph produced with the invention. As shown in the graph, 17% of Flowers R Us customers represent 48% of the merchant's transactions.

15 It is also possible to work out from this information the value of these 17% of customers based on the value of the transactions.
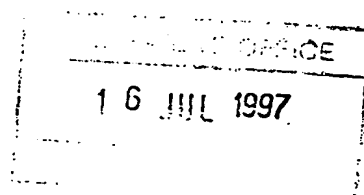
As shown in Figure 9, it is possible to provide Flowers R Us with the proportion of customers 12 it shares with other merchants. For example, 35.9% of Flowers R Us

20 customers are also customers of Peter's Petrol Limited. The merchant 16 may consider joint advertising with Peter's Petrol Limited to reduce advertising expenditure. as the two merchants share a large customer base which would be reached by the advertising. It is also possible to provide Flowers R Us with the proportion of customers it shares with competitors.

25

A further report is illustrated in Figure 10, showing information of repeat purchases by customers. Of Flowers R Us customers, 34% have purchased goods or services once from Flowers R Us, 26% purchased twice, and so on. This information may also be combined with information about products and other information.

30

According to this invention. a method and system for building a database based upon retail transactions is provided. The method used allows a financial institution. third party. or merchant to compile customer data easily and present it to merchants. allowing merchants to understand their customers better.
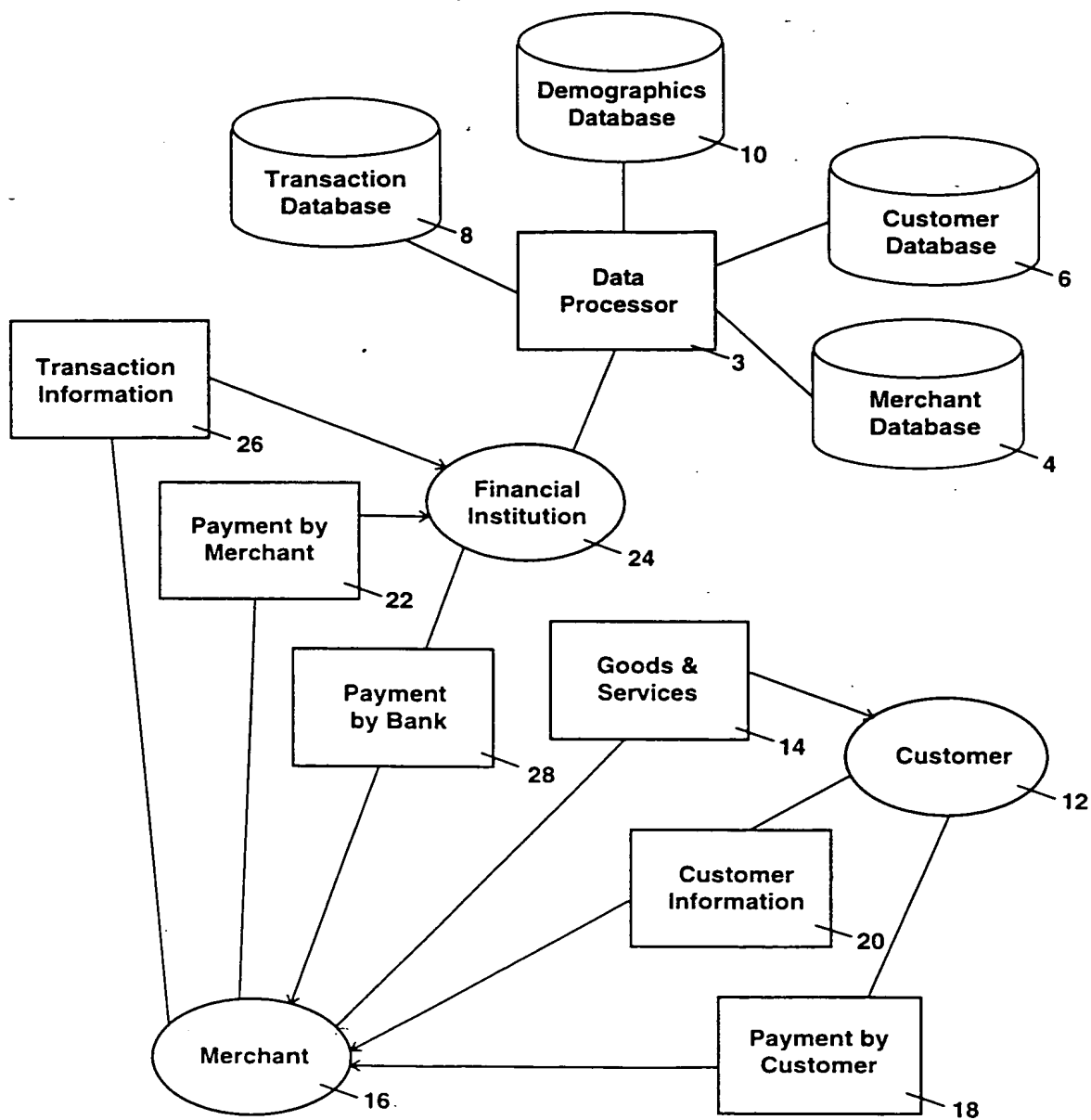
Figure 1

Transaction Table

30 — merchant ID
32 — customer ID
34 — transaction date/time
transaction value
.
.
.

8A

Customer Table

customer ID ——— 32
location
.
.

6A

Merchant Table

30 ——— merchant ID
merchant name
merchant details
.
.
.

4A

Demographic Table

36 — location
age
gender
income
.
.
.

10A

Figure 2

Transaction Table

merchant ID: MERC1
customer ID: CUST1
transaction date/time: 05031997/09017

transaction value: 35.00
.
.
.

8A

Customer Table

customer ID: CUST1

location: Roseneath
.
.
.

6A

Merchant Table

merchant ID: MERC1
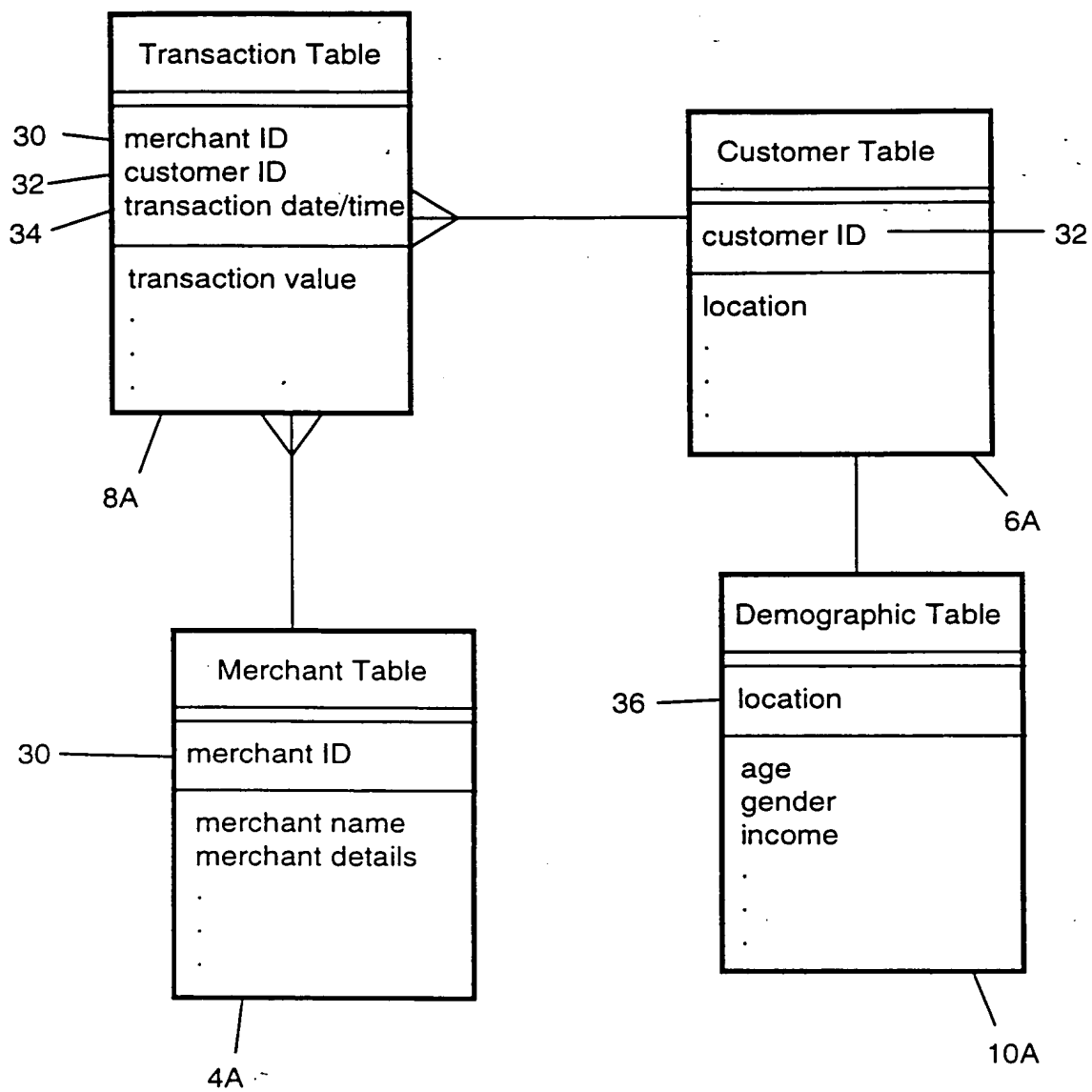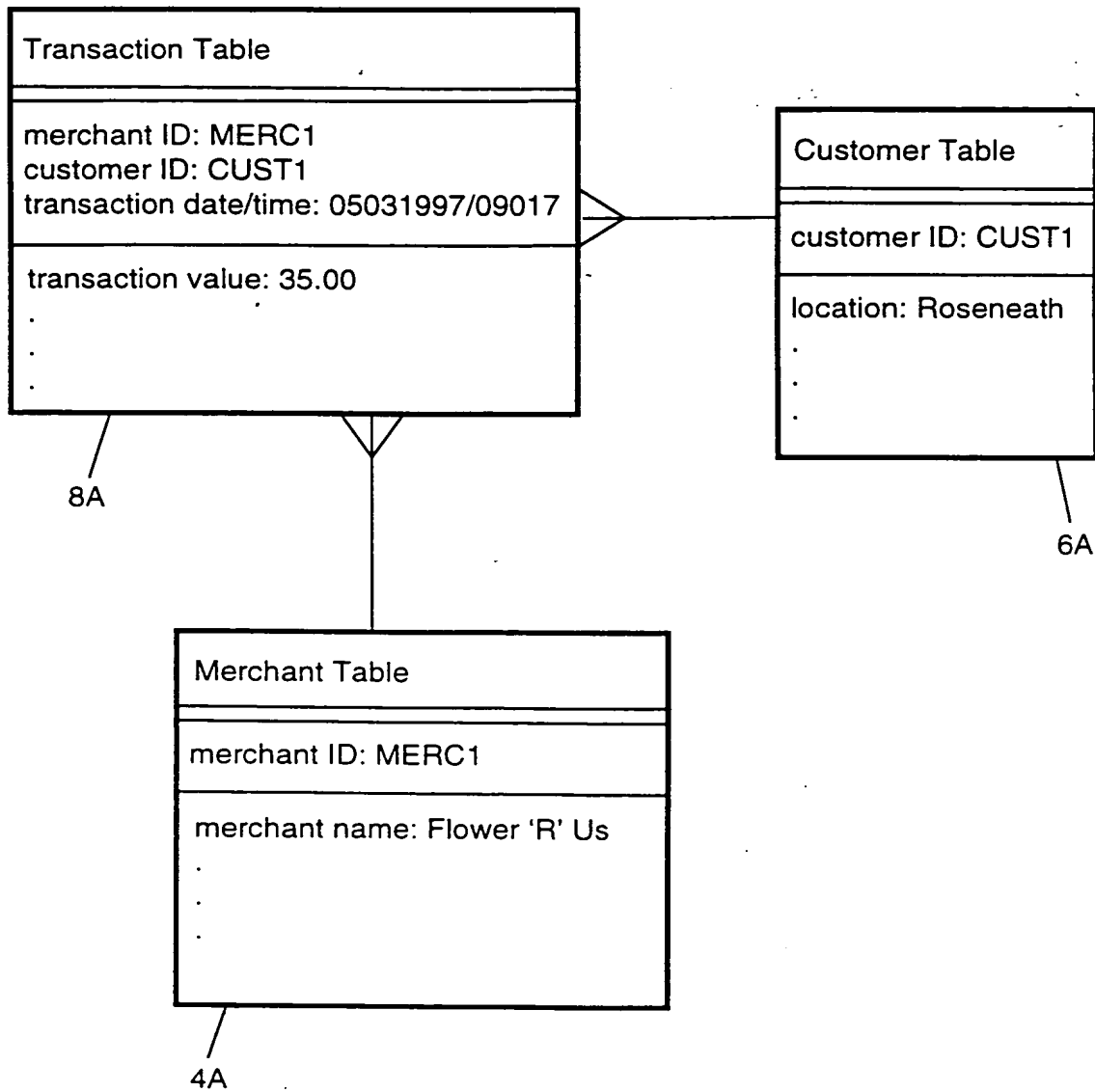
merchant name: Flower 'R' Us
.
.
.

4A

Figure 3

General Demographics

Flowers R Us customers are in general
- Low numbers of Maori and Pacific Islanders
- Likely to have qualifications
- Less likely to be unemployed
- Less likely to be on income support
- Likely to have access to a motor vehicle
- Most likely to have access to two or more motor vehicles
- Likely to own their own homes
- Unlikely to earn $15,000 or less
- Very likely to earn $40,000 or more
- Average personal income $22,000
- Average household income $15,000
- Predominantly aged between 25 to 45 years old
- Least likely to have income between $5,000 & $10,000
- Most likely to have income over $30,000
- More likely to be self employed or an employer of others
- More likely to in administrative type employment
- Most likely to be in "White Collar" employment

Figure 4

Flowers R Us Customer Countries

Country	% of Customers
New Zealand	87.2
Australia	5.5
Japan	2.4
USA	1.7
Other	3.2

Figure 5

Flowers R Us Customer Types

Customer Type	NZ %	Your Regional %	Your Customers %	Your Customers in Region %
Educated Money	8.25	11.53	14.63	126.89
Inner City Professional	3.24	8.02	12.28	153.12
High Income Upwardly Mobile	5.14	11.01	19.09	173.39
White collar	9.19	12.35	14.26	115.47
Young Families in New Housing	6.31	5.54	2.46	44.40
Outer Suburban Families	9.27	4.70	2.18	46.38
Urban Singles	5.94	6.90	9.24	133.91
Provincial Middle NZ Families	6.95	0.03	0.00	0.00
Rural Lands	7.01	0.00	0.00	0.00
Coastal and Lake Retirement	4.78	0.04	0.00	0.00
Older Retirees Living Alone	8.13	7.92	2.68	33.84
Blue Collar Suburbia	14.69	15.32	6.02	39.30
Single and Separate	5.51	7.91	15.91	201.14
Maori & Pacific Is. Families	5.59	8.73	1.25	14.32
Totals	100.00	100.00	100.00	

Figure 6

Flowers R Us Geographical Density Maps

Figure 7

Flowers 'R' Us Customer Value

% Value (y-axis): 100, 75, 50, 25, 0

% Customers (x-axis): 0, 25, 50, 75, 100

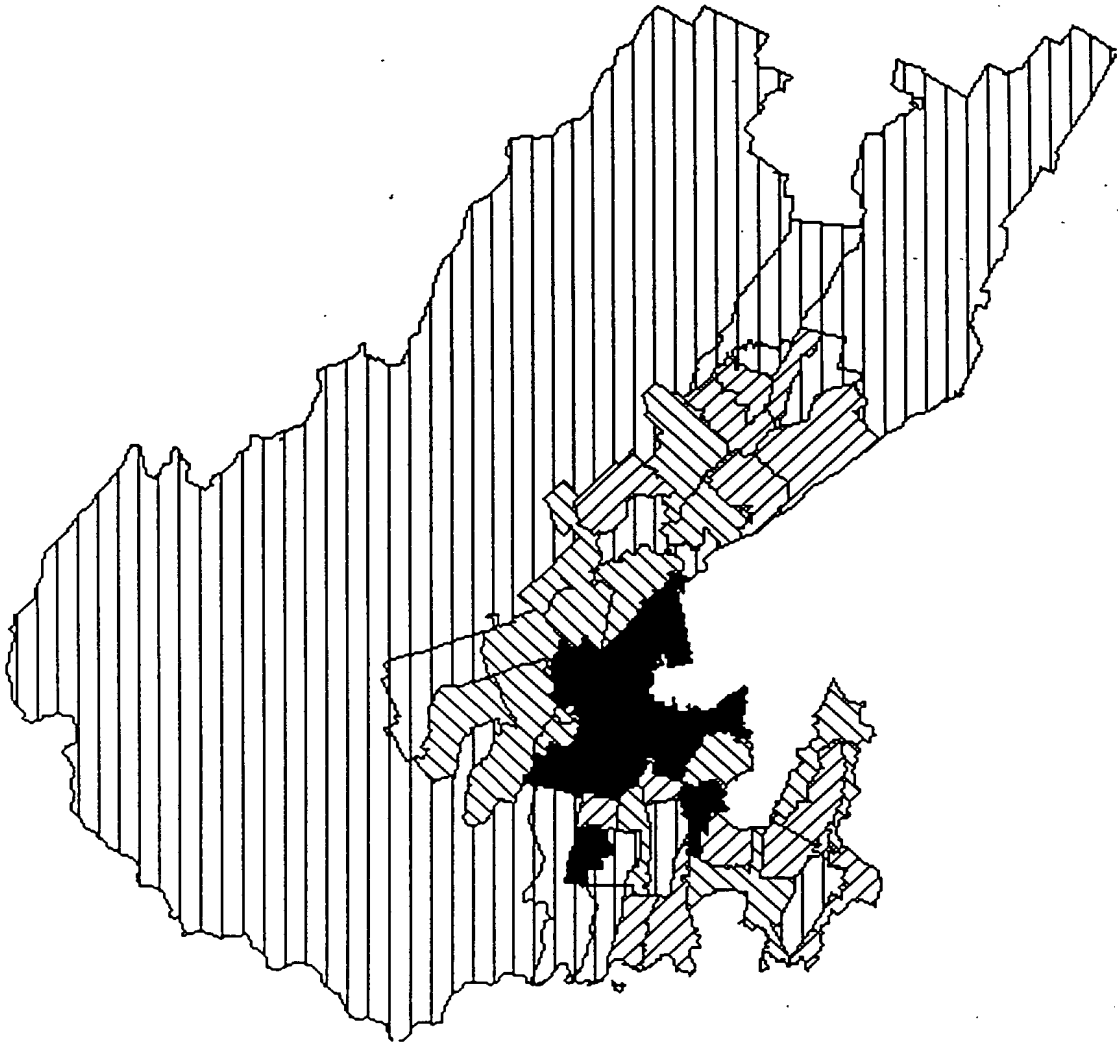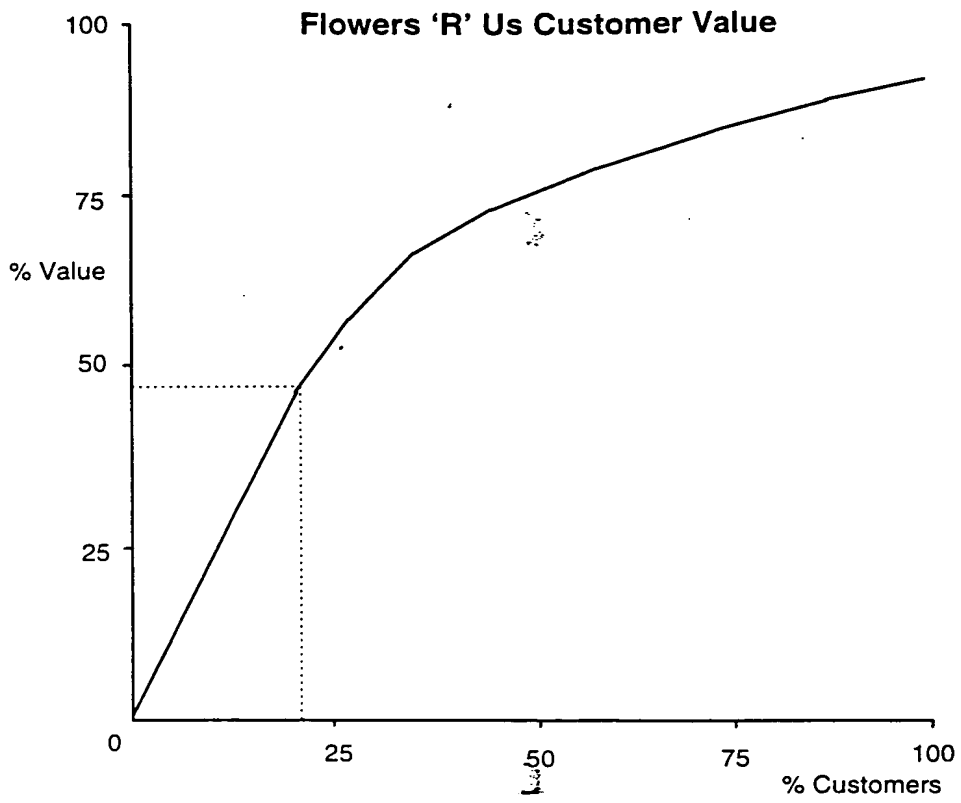**Figure 8**

Merchants

Flowers R Us customers are also customers of the following merchants

Merchant	% of your customers over
Peter's Petrol Ltd	35.9%
Jay's Jeans	32.4%
Bob's Bar	24.7%
Simon's Supermarket	24.4%
Design Shop	21.0%
Pizza 2 Go	19.5%
Ken's Cabs	14.3%

Figure 9

Repeat Purchases

	% of Customers
1 Purchase	34
2 Purchases	26
3 Purchases	12
4 Purchases	11
5+ Purchases	17

Figure 10

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